

**CLAIMS**

1. A touch probing device for inspecting an object, comprising:  
a fixed part,  
a movable part coupled to and movable with respect to the fixed part in means  
5 for measuring the motion between the fixed and the movable parts, and contact means  
coupled to the movable part for contacting a surface of an object, wherein  
the contact means is coupled to the movable part via a shock absorber.
2. The touch probing device of claim 1, further comprising weight  
10 compensating means for compensating the weight of the movable part, by use of a  
magnetic field.
3. The touch probing device of claim 2, wherein the weight compensating  
means comprises a series of permanent magnets arranged to exert a substantially  
15 constant magnetic force onto the movable part.
4. The touch probing device of claim 2, comprising a further weight  
compensating means.
- 20 5. The touch probing device of claim 4, wherein the further weight  
compensating means comprises tension springs or counterweights.
6. The touch probing device of claim 1, wherein the movable part has a  
higher mass and a lower stiffness than the movable part of the shock absorber and the  
25 contact means.
7. The touch probing device of claim 6, wherein the movable part has a  
mass at least two orders higher than the total mm of the movable part of the shock  
absorber and the contact means.
- 30 8. The touch probing device of claim 7, wherein the movable part has a  
stiffness about two orders lower than the total stiffness of the movable part of the  
shock absorber and the contact means.

9. The touch probing device of claim 1, comprising a parallel kinematics motion transmission assembly coupling the fixed part with the movable part, which assembly is designed to offer three translation degrees of freedom

5 10. The touch probing device of claim 9, wherein the motion transmission assembly exhibits uniform stiffness in all spatial directions.

11. The touch probing device of claim 9, wherein the motion transmission assembly comprises three separate transmission units coupling the fixed part with the  
10 movable part, which units are each designed to offer three translational degrees of freedom and to prevent one rotational degree of freedom.

12. The touch probing device of claim 11, wherein each transmission unit comprises a measuring means.  
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13. The touch probing device of claim 5, wherein each transmission unit comprises flexural links.

14. The touch probing device of claim 11, wherein each transmission unit  
20 comprises weight compensating means.

15. The touch probing device of claim 1, wherein the shock absorber exhibits a uniform stiffness in all spatial directions.

25 16. The touch probing device of claim 1, wherein the shock absorber comprises one or more leaf-spring elements which prevent one rotational degree of freedom and two translational degrees of freedom.

17. A coordinate measuring machine comprising the touch probing device  
30 of claim 1.

18. A touch probing device for inspecting an object, comprising  
a fixed part,  
a movable part coupled to the fixed part in such that it allows for a motion of  
the movable part with respect to the fixed part,  
5 measuring means for measuring the motion between the fixed and the movable  
parts,  
contact means coupled to the movable part for contacting a surface of the  
object, and  
weight compensating means for compensating the weight of the movable part,  
10 wherein  
the weight compensating means uses a magnetic field for compensating the  
weight of the movable part .

19. The touch probing device claim 18, comprising a parallel kinematics  
15 motion transmission assembly coupling the fixed part with the movable part, which  
assembly is designed to offer three translation degrees of freedom.

20. The touch probing device of claim 19, wherein the motion  
transmission assembly comprises three separate transmission units coupling the fixed  
20 part with the movable part, which units are each designed to offer three translational  
degrees of freedom and to prevent one rotational degree of freedom.

21. The touch probing device of claim 20, wherein each transmission unit  
comprises a measuring means.  
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22. The touch probing device of claim 20, wherein each transmission unit  
comprises flexural links.

23. The touch probing device of claim 20, wherein each transmission unit  
30 comprises weight compensating means.

24. The touch probing device claim 19, wherein the motion transmission  
assembly exhibits uniform stiffness in all spatial directions.

25. The touch probing device of claim 18, wherein the weight compensating means comprises a series of permanent magnets arranged to exert a substantially constant magnetic force onto the movable part.

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26. The touch probing device of claim 18, comprising a further weight compensating means.

27. The touch probing device of claim 26, wherein the further weight  
10 compensating means comprises tension springs or counterweights.

28. A coordinate measuring machine comprising the touch probing device  
of claim 18.

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